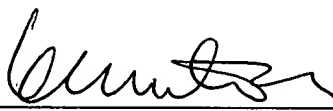


REMARKS

The Summary of the Invention, the Claims and the Abstract of the subject application are amended to change "long-range dependence" to --self-similarity--. This amendment corrects a potential ambiguity in the claims as the term "long-range" is an unqualified relative term. Basis for this amendment may be found in the specification in the title and at pages 1-5. The specification and claim 13 have also been amended to replace the word "eliminate" with --reduce--. Basis for this amendment may be found in claims 1 and 8 and in the Abstract. No new matter is added by these amendments.

Respectfully Submitted,



Kenneth N. Nigon, Reg. No. 31,549  
Attorney for Applicant

KNN/tmb

Enclosures: Version with markings to show changes made

Dated: January 3, 2002

P.O. Box 980  
Valley Forge, PA 19482-0980  
(610) 407-0700

The Assistant Commissioner for Patents is hereby authorized to charge payment to Deposit Account No. 18-0350 of any fees associated with this communication.

I hereby certify that this correspondence is being deposited with the United States Postal Service with sufficient postage as first class mail in an envelope addressed to: Assistant Commissioner for Patents, Washington, D.C. 20231 on:

January 3, 2002



Kenneth N. Nigon

VERSION WITH MARKINGS TO SHOW CHANGES MADESPECIFICATION:

## Specification paragraph [0006]:

**[0006]** The present invention is embodied in a scheduling method for data in a digital communication network that improves transmission by breaking up self-similarities ~~long-range dependencies~~ in the data while preserving local order. The scheduling method reorders individual blocks of data in a macro-block while preserving the order of the data in each block. An exemplary embodiment of this method contains several steps. The first step is to define the data in terms of macro-blocks, each macro-block including a plurality of blocks. The blocks of a macro-block are reordered to substantially ~~eliminate~~ reduce the self-similarity ~~long-range dependence~~ of the data in the macro-block. The reordered blocks are then transmitted through the network, and reordered again at the other side to recreate the macro-block.

## Specification paragraph [0007]:

**[0007]** According to one aspect of the invention, a digital communications network includes a shuffling buffer at an input node to shuffle blocks of the data and thereby substantially ~~eliminate~~ reduce self-similarity ~~long-range dependence~~ in the data. It also includes at least one transmission node through which the shuffled data is sent, and a reconstruction buffer at a client node to reconstruct the shuffled data into its original order.

CLAIMS:

- 1 1. (Amended) A method for transmitting a data stream that exhibits
- 2 ~~long-range dependence~~ self-similarity through a digital communication network,
- 3 comprising the steps of:

4 (a) receiving a plurality of blocks in the data stream, each block including  
5 a plurality of data values;

6 (b) reordering the blocks according to a predetermined deterministic  
7 scheme to reduce the ~~long-range-dependence~~ self-similarity of the data stream;

8 (c) transmitting the reordered blocks through the digital communications  
9 network to a receiving node; and

10 (d) reordering the blocks again, at the receiving node, to reverse the  
11 predetermined deterministic scheme and regenerate the data stream.

1 8. (Amended) A data transmission interface for a digital  
2 communications network which transmits data from an input node to an output node, a  
3 portion of said data exhibiting a ~~long-range-dependence~~ self-similarity, comprising:

4 means for receiving blocks of data to be transmitted through the network,  
5 each block including a plurality of data values;

6 a shuffling buffer which reorders blocks of the received data according to a  
7 predetermined deterministic scheme reduce the ~~long-range-dependence~~ self-similarity of  
8 the data and to provide the reordered blocks of data to the input node of the network; and

9 a reconstruction buffer, coupled to receive the reordered data from the  
10 output node of the digital communications network, the reconstruction buffer reordering  
11 the data to reverse the predetermined deterministic scheme and reconstruct the received  
12 data.

1 10. (Amended) The digital communications network of claim 8, further  
2 comprising a plurality of transmission nodes in the data communications network, each  
3 transmission node having a queuing buffer, wherein each queuing buffer has a  
4 predetermined memory size sufficient only to queue data that does not exhibit ~~long-range~~  
5 ~~dependence~~ self-similarity through the network.

1                   11. (Amended) A data transmission interface method which configures  
2 data exhibiting ~~long-range-dependence~~ self-similarity for transmission through a digital  
3 communications network from an input node to an output node of the network, the method  
4 comprising the steps of:

5                   receiving blocks of data to be transmitted through the network, each block  
6 including a plurality of data values;

7                   reordering the received blocks data according to a predetermined  
8 deterministic scheme reduce the ~~long-range-dependence~~ self-similarity of the data;

9                   providing the reordered blocks of data to the input node of the network; and

10                  retrieving the reordered blocks of data from the output node of the network;  
11 and

12                  reordering the data to reverse the predetermined deterministic scheme and  
13 reconstruct the received data.

1                   12. (Amended) A computer readable carrier including computer  
2 program instructions that control first and second computers coupled, respectively, to an  
3 input node and an output node of a digital communications network, the computer  
4 program instructions implementing a method that formats data which exhibits ~~long-range~~  
5 ~~dependence~~ self-similarity for transmission through the digital communications network,  
6 the method comprising the steps of:

7                   receiving blocks of data to be transmitted through the network at the first  
8 computer, each block including a plurality of data values;

9                   reordering the received blocks data according to a predetermined  
10 deterministic scheme at the first computer to reduce the ~~long-range-dependence~~ self-  
11 similarity of the data;

12                  providing the reordered blocks of data to the input node of the network;

13                    retrieving the reordered blocks of data from the output node of the network  
14                    at the second computer; and

15                    reordering the data, at the second computer, to reverse the predetermined  
16                    deterministic scheme and reconstruct the received data.

1                    13.    (Amended)    A computer readable carrier including computer  
2                    program instructions adapted to instruct a general purpose computer to implement a  
3                    method that substantially ~~eliminates-reduces long-range-dependence~~ self-similarity  
4                    of data using a scheduling method, the method comprising the steps of:

5                    (a)    receiving a plurality of blocks of data, each block having a  
6                    predetermined block size; and

7                    (b)    reordering the blocks of data according to a predetermined  
8                    deterministic scheme to substantially ~~eliminate-reduce~~ the ~~long-range-dependence~~  
9                    self-similarity of the blocks of data.

ABSTRACT:

The present invention is a data formatting method for data in a digital communication network. The first step in the method is to identify a predetermined number of blocks in the data stream, each block including several data values. The blocks are shuffled by skipping a number of blocks of the input data between consecutive blocks of transmitted data and periodically resetting the skip pointer to transmit the skipped blocks as a part of a later skip operation. The shuffled blocks are then transmitted through the network and reordered again at the other side to recreate the original data stream. Others blocks are similarly reordered and transmitted. The shuffling of the blocks of data ~~reduces long-term-dependency~~ self-similarity in the data while maintaining local order.